Section 7
Wildlife

TETRA TECH

May 18, 2012

Mr. Erle Townsend
Project Manager
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Subject: Canton Mountain Wind Project, Avian Radar Re-analysis and Assessment for Siemens SWT 3.0-113 Wind Turbine

Dear Erle,

Patriot Renewables, LLC (Patriot) requested that Tetra Tech, Inc. (Tetra Tech) review and assess how the proposed alternate Siemens 3.0-113 turbine model would affect target passage rates within the rotor swept zone (RSZ) at the Canton Mountain Wind project (CMW Project).[1] Tetra Tech performed avian radar studies for CMW in the spring and fall of 2010 and calculated target passage rates and percent of targets within the RSZ of 36 to 130 m (83 m tower, 94 m rotor). This avian radar data was analyzed and submitted to the Maine Department of Environmental Protection (MDEP) with Site Location of Development Act and Natural Resources Protection Act permit applications on December 22, 2011. Tetra Tech was notified by DeTect in early April 2012 that a data-processing issue had occurred during the analysis of the vertical radar data for the CMW Project that erroneously resulted in the double counting of biological targets. DeTect reprocessed the data and submitted the results to Tetra Tech in late April 2012. Revised spring and fall avian survey reports were submitted to MDEP in May of 2012.

Following this reanalysis, Patriot requested that Tetra Tech assess the effects of the alternate Siemens 3.0-113 turbine model on the spring and fall avian radar data for the CMW Project. The RSZ for the Siemens 3.0 turbine model would extend from 33.5 to 146.5 m (90 m tower, 113 m rotor) above ground level. This model has a rotor diameter that is 19 m greater than that of the turbine previously analyzed.

For the purpose of this re-analysis, Tetra Tech examined the data from a recently re-analyzed radar data set from the Saddleback Ridge Wind Project, where a larger turbine was compared to a smaller turbine. Based on this re-analysis at Saddleback Ridge, it was determined that when the lower and upper limits of the RSZ increased by a total of 10 percent, an 18.5 percent increase of targets were identified within the RSZ during spring migration and a 10 percent increase in targets within the RSZ were identified during the fall migration period.

For the CMW project, Tetra Tech estimated that a 20 percent increase in the RSZ (to account for the increase from a 94 m rotor to a 113 m rotor), would equate to a 20 to 40 percent increase in passage rates and percent of targets that occur within the RSZ, based directly on the results observed at Saddleback Ridge.

[1] The rotor swept zone (RSZ) is the range of heights that the turbine blades will span within the 1-km front swept by the radar. The RSZ includes the ridgeline where the turbines would be constructed, as well as area on both sides of the ridgeline outside of the rotor airspace.

Table 1 provides a comparative analysis of the original 2010 erroneous avian data analysis (see the May 16, 2012 Avian Radar Re-analysis for Canton Mountain Wind letter from Tetra Tech for a detailed explanation), the 2012 complete reanalysis of the avian radar data, and a qualitative assessment of the expected increase of targets in the RSZ based on a 19 meter increase of the RSZ for the Siemens 3.0-113 turbine.

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Table 1. Canton Mountain Radar Data Summary and Assessment of nocturnal migration for varying turbine models and sizes.

Canton Mountain Radar Data - Spring 2010 Nights											
Data Set	Turbine Model	Wind Turbine Specs	Average Target Passage Rate (TPR)	Average Mean Target Height (m)	Average Median Target Height (m)	Rotor Swept Zone (RSZ)	Average TPR in RSZ	Percent of Targets in RSZ	Percent Increase of Targets within RSZ	Percent Increase of Wind Turbine RSZ	Comments
2010 Original-Faulty data	Default RSZ	83 m tower, 94 m rotor	627.6 m	218.2 m	157.8 m	36 to 130 m	122.3	19.8%	-	-	Faulty data set
* 2012 Data corrected	Default RSZ	83 m tower, 94 m rotor	303.9 m	197.0 m	140.3 m	36 to 130 m	76.9	25.3%	n/a	n/a	Baseline data set
**2012 Data estimate for alternate turbine model	Siemens 3.0-113	90 m tower, 113 m rotor				33.5 to 146.5 m	92.3 to 107.7	30.4 to 35.4%	20 to 40%	20.0%	Percentages were extrapolated for larger turbine
Canton Mountain Radar Data - Fall 2010 Nights											
Data Set	Turbine Model	Wind Turbine Specs	Average Target Passage Rate (TPR)	Average Mean Target Height (m)	Average Median Target Height (m)	Rotor Swept Zone (RSZ)	Average TPR in RSZ	Percent of Targets in RSZ	Percent Increase of Targets within RSZ	Percent Increase of Wind Turbine RSZ	Comments
2010 Original-Faulty data	Default RSZ	83 m tower, 94 m rotor	292	157.9	134.4	36 to 130 m	112.1	38.2%	-	-	Faulty data set
* 2012 Data corrected	Default RSZ	83 m tower, 94 m rotor	181.1	177.8	157.0 m	36 to 130 m	107.3	35.6%	n/a	n/a	Baseline data set
**2012 Data estimate for alternate turbine model	Siemens 3.0-113	90 m tower, 113 m rotor				33.5 to 146.5 m	128.8 to 150.2	42.7 to 49.8%	20 to 40%	20.0%	Percentages were extrapolated for larger turbine

* Data was reanalyzed to account for a heading pulse issue that was responsible for double counting biological targets

** Radar data was reanalyzed at another project (Saddleback Ridge) to account for larger turbines there. The ranges observed at Saddleback were extrapolated for Canton Mountain to account for 20% increase in RSZ

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As indicated in Table 1, the larger turbine and RSZ has a greater percentage of biological targets within the RSZ and therefore a somewhat increased risk to these nocturnal migrants. The corrected CMW Project radar data generally have a low magnitude of migration compared to other regional sites but also showed lower flight heights generally with a higher percentage of targets in the RSZ. The average mean flights heights of nocturnal migrants during the spring (197 m) and fall (177.8 m) migration period at Canton Mountain in 2010 were above the top of the proposed RSZs for both turbine sizes. Median flight heights for the spring were slightly below (140.3 m) the proposed RSZs, while median flight heights from the fall were above (157 m) the proposed RSZs.

As always, please do not hesitate to contact me at Kathleen.miller@tetratech.com or at 207.409.9738, if you have questions or require additional information.

Sincerely,
TETRA TECH, Inc.

Kathleen R. Miller

Kathleen R. Miller
Project Manager
Attachments

cc: Andy Novey, Project Manager, Patriot Renewables, LLC
Lindsay Galbraith, Patriot Renewables, LLC
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